driodic acid for the normal hydriodide of the alkaloid, necessary to hold the additive iodine of the periodide. When carbon disulphide or carbon tetrachloride is used as solvent for the atropine and the iodine, no periodide seems to be formed, possibly for the reason of there being no generation of hydriodic acid for the making of hydriodide. As to the formation of the periodides in chloroformic solutions of atropine and iodine, it might possibly be explained by the substituting action of iodine either upon the chloroform or upon a side-chain of the atropine.

The direct substitution of iodine for some of the hydrogen in these bodies might, in this case, be made possible by the presence of the natural base which combines with the hydriodic acid, when formed by such a substitution. Part of the atropine would then act in a manner similar to that of mercuric oxide, which is usually employed in the iodizing of hydrocarbons. An analogous case we have in the easy substitution of iodine for some of the hydrogen in aniline, a part of which combines with the hydriodic acid, which is set free through the substitution of iodine for hydrogen in another part. At any rate we shall endeavor to determine the by-products formed when atropine enneaiodide is produced in chloroformic solutions.

UNIVERSITY OF MICHIGAN,
FEBRUARY 28, 1898.

COMPOSITION OF THE ASHES OF SOME RAW TANNING MATERIALS.[1]

BY WM. K. ALSOP AND J. H. YOCUM.

Received March 15, 1898.

NO systematic investigation of tannin sources has been published which covers not only the tannin itself, but also the other chemical compounds found in the raw material. With the object of making a complete analysis of some of the common sources of tannin, we present this paper on the ash and tannin analysis, and hope in the future to present others bearing upon the sugars and other soluble non-tannins, celluloses, and red coloring material.

In the table presented showing the tannin content of oak and hemlock bark, the averages from two widely separated localities for each of a large number of analyses, are given. The method

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[1] Read before the New York Section, March 11, 1898.

of determining the tannin followed, was that of the Association of Official Agricultural Chemists for 1897. The total extract is the result obtained by extracting the bark with boiling water and evaporating the solution; the residue left in the extractor is reported as cellulose and insoluble, and was obtained by difference. A larger total extract can be obtained if alcohol be used as the extracting medium, this increase being of the nature of the red coloring material, hence the residue from a water extraction is not pure cellulose. The total extract (with water) when at 95° C., dissolves a considerable portion of the red coloring material from the bark, they being precipitated upon cooling the solution. The soluble solids are the solids of extract solution soluble at 18° C., and the red coloring material is the difference between total solids and soluble solids. The non-tannins are that portion of the soluble solids not absorbed by hide and are mainly glucosides of unknown composition. Tannins are the difference between soluble solids and non-tannins. Moisture was determined by drying at 100° C. In the table giving the ash analysis, the results, marked $Al_2O_3 + Fe_2O_3$, represent practically alumina, as only traces of ferric oxide could be found in the precipitate.

The extract results give the portion of the ash removed by leaching, since it required three portions of bark to make one of extract. During the extraction only 0.44 per cent. of ash was removed from the bark. The very much greater ash of oak over hemlock bark and the higher proportionate amount of lime is no doubt due to the fact that hemlock does not grow on a limestone soil.

	Chestnut-oak bark.	Chestnut-oak bark.	Hemlock bark.	Hemlock bark.	Quebracho wood.	Oak-bark extract.
Number of samples	118	117	81	50	1	1
Total extract	24.69	19.76	19.33	19.96	24.80	46.92
Total soluble solids	20.36	16.26	15.40	16.11	19.20	45.96
Red coloring material	4.33	3.50	3.93	3.85	5.60	0.96
Non-tannins	9.81	8.21	6.74	6.44	3.64	20.29
Tannins	10.55	8.05	8.66	9.67	15.56	25.67
Moisture	10.85	9.73	11.57	13.75	11.60	53.17
Cellulose and insoluble matter	64.46	70.51	69.10	66.29	63.60	....

	Chestnut-oak bark. No. 1.	Chestnut-oak bark. No. 2.	Hemlock bark. No. 3.	Hemlock bark. No. 4.	Quebracho wood. No. 5.	Oak-bark extract. No. 6.	Leached oak bark. No. 1.	Leached oak bark. No. 2.	Leached hemlock bark. No. 3.
Ash	6.02	8.05	1.65	1.45	0.88	1.35	6.35	6.96	1.55
Carbon	0.77	0.11	0.23	0.59	0.11	1.57	0.15	0.15	....
Sand and silicic acid	2.34	3.33	....	....	0.88	1.88	....	....	7.15
Sand	....	....	1.12	3.53	....	....	1.52	1.46	....
SiO_2	....	...	0.78	2.84	....	....	1.40	0.77	....
$Al_2O_3+Fe_2O_3$	0.08	0.86	3.07	3.86	0.64	5.59	0.71	0.55	2.05
MnO	1.26	0.33	2.26	4.09	0.10	2.21	0.58	0.28	2.41
CaO	52.63	58.24	52.52	49.35	61.27	19.15	57.42	60.50	53.97
MgO	1.18	1.77	1.98	2.92	4.56	2.38	0.56	1.13	1.68
K_2O	2.95	2.62	6.02	7.64	0.24	29.44	1.77	0.84	2.35
Na_2O	0.63	0.40	0.27	0.95	1.22	1.01	0.44	0.38	0.66
Cl	0.44	0.10	0.20	0.24	not det	not det	0.10	0.19	not det
SO_3	0.17	0.12	0.82	1.88	1.11	2.86	0.17	0.12	1.71
P_2O_5	0.64	1.13	2.62	2.94	0.50	3.72	0.51	0.15	1.98
CO_2	36.51	31.47	27.66	19.10	28.30	not det	33.88	33.15	25.50
	99.60	100.49	99.55	99.93	98.93		99.21	99.67	99.46

[Contributions from the Chemical Division of the U. S. Department of Agriculture, No. 33.]

ON THE DETERMINATION OF POTASH WITHOUT THE PREVIOUS REMOVAL OF IRON, CALCIUM, ETC.

By C. C. Moore.[1]

Received March 18, 1898.

I HAVE found it practicable to wash out ferric, aluminic and other chlorides, and the excess of platinic chloride which is present by means of an acidulated alcoholic wash. Thus it is possible to avoid the precipitation and filtering of ferric hydroxide, calcium oxalate, etc., and the subsequent evaporation and ignition for the removal of ammoniacal salts.

The substance under examination is brought into solution by the usual acid digestion, and the excess of acid removed by evaporation, the residue and insoluble matters separated by filtration. The filtrate is now ready for the potash estimation. To it is added the usual platinic chloride solution, only enough

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[1] Communicated by Dr. H. W. Wiley.